BOWEL PATTERN IN GENERAL POPULATION AND IN IRRITABLE BOWEL SYNDROME

Dissertation submitted for

DM BRANCH IV

MEDICAL GASTROENTEROLOGY

THE TAMILNADU DR. MGR MEDICAL UNIVERSITY

CHENNAI

FEBRUARY 2006

CERTIFICATE

This is to certify that this dissertation on **"Bowel Pattern in General Population and in Irritable Bowel Syndrome "** is a bonafide work done by **Dr. N. RAJESH** under my guidance and supervision, appearing for D.M. Branch IV Medical Gastroenterology in February 2006.

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I, **Dr.N. Rajesh,** solemnly declare that the dissertation titled **"Bowel Pattern in General Population and in Irritable Bowel Syndrome "**was done by me at Govt. Stanley Medical College & Hospital during the academic year 2003 – 2006 under the guidance and supervision of my chief, **Prof. V. JAYANTHI. M.D., D.M.**

This dissertation is submitted to the Tamil Nadu Dr. M. G. R. Medical University towards the partial fulfilment of requirement for the award of D.M. Degree Branch IV in Medical Gastroenterology.

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ACKNOWLEDGEMENT

I owe my thanks to the Dean, Govt. Stanley Medical College and Hospital, **Dr.T. Raveendran M.D.,D.T.C.D.** for allowing me to avail the facilities needed for my dissertation work.

I express my sincere gratitude to my **Prof. V. JAYANTHI, M.D.,D.M.,** Head of the Department of Medical Gastroenterology, Govt. Stanley Medical College & Hospital, Chennai for her valuable guidance, constant support, supervision, co-operation and help in every stage of the study which has made this dissertation work possible.

My sincere thanks to **Dr. A. MURALI M.D.,D.M.,** Asst. Professor, Department of Medical Gastroenterology, Govt. Stanley Medical College & Hospital, Chennai for his valuable guidance.

I am thankful to **Dr. T. RAJKUMAR SOLOMON M.D.,D.M.,** Asst. Professor, Department of Medical Gastroenterology, Govt. Stanley Medical College & Hospital, Chennai for his valuable support.

I am grateful to **Dr. M. S. REVATHI M.D.,D.M.,** Asst. Professor, Department of Medical Gastroenterology, Govt. Stanley Medical College & Hospital, Chennai 600 001 for her assistance and support.

I am thankful to **Dr.K. CAROLINE SELVI M.D.,D.M.,** Asst. Professor, Department of Medical Gastroenterology, Govt. Stanley Medical College & Hospital, Chennai for her constant support and assistance.

I express my thanks to **Mr.A. Vengatesan M.Sc., P.G.D.C.A., C.C.E**

Lecturer in Statistics for helping me in Statistical Analysis.

Last but not the least, I express my sincere thanks to all the patients for their kind co-operation, without whom this study could not have been undertaken and to all my colleagues who shared their knowledge about the study.

CONTENTS

Bowel Pattern in General Population and in Irritable Bowel Syndrome

INTRODUCTION

Normal bowel habits vary considerably from person to person. Anything from 3 times a day to 3 times a week can be quite normal. The colon and rectum plays an important role in regulating the bowel frequency, its movement and in maintaining its consistency.

Normal Physiology

The colon receives approximately 1.5 liters of fluid each day. The normal fluid volume of stool is about 100 ml. The ascending and transverse colon serves as a site for storage and fluid and electrolyte absorption. The descending and sigmoid colon functions as a conduit. Faeces empty rapidly from the cecum and ascending colon and are retained for several hours in the transverse colon. The descending colon propels material into the rectum, where it is stored prior to defecation. Following a meal and after awakening, high amplitude contractions propagate from the proximal to distal sigmoid colon, pushing the stool mass into the rectum. Normal transit from the cecum to the rectum using radio opaque markers varies from 24 to 100 hours in different population

Normal defecation is controlled by the pelvic complex, a funnel consisting of two overlapping sphincters surrounding the anus: an internal sphincter composed of involuntary smooth muscle and an external sphincter composed of voluntary skeletal muscle that maintains continence. When the rectum is empty, the internal sphincter muscle is tonically contracted and the external sphincter relaxed. When stool is propelled into the rectum, stretch receptors in the walls are stimulated. These receptors activate nerve cells in the intramural plexus. In turn, inhibitory interneurons decrease the activity of the muscles of the internal anal sphincter, causing it to relax. Following internal sphincter relaxation, stool comes in contact with the very

sensitive anoderm lining of the external anal canal. This leads to an urge to defecate. If convenient, toileting proceeds by assuming a squatting position, which straightens the anal canal, and then a Valsalva maneuver is performed which increases intraabdominal pressure, and defecation proceeds, evacuating the rectum. Alternatively, the external anal sphincter and gluteal muscles can be contracted voluntarily, ejecting the fecal mass out of the rectal ampulla back into the rectal vault. The urge to defecate subsides until the rectum again becomes distended (Fig 1 & 2).

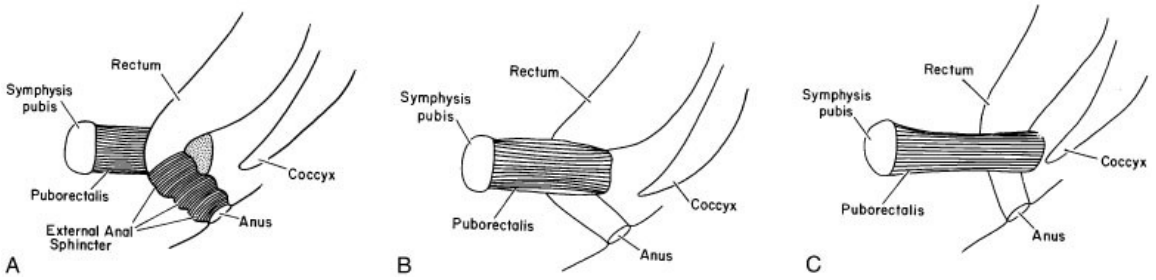


Figure 1. Anatomic considerations of continence. *A,* Relationship of external anal sphincter, puborectalis muscle, and rectum. *B,* Puborectalis muscle contracting to maintain continence. *C,* Puborectalis muscle relaxing to allow straightening of the rectoanal angle for defecation.

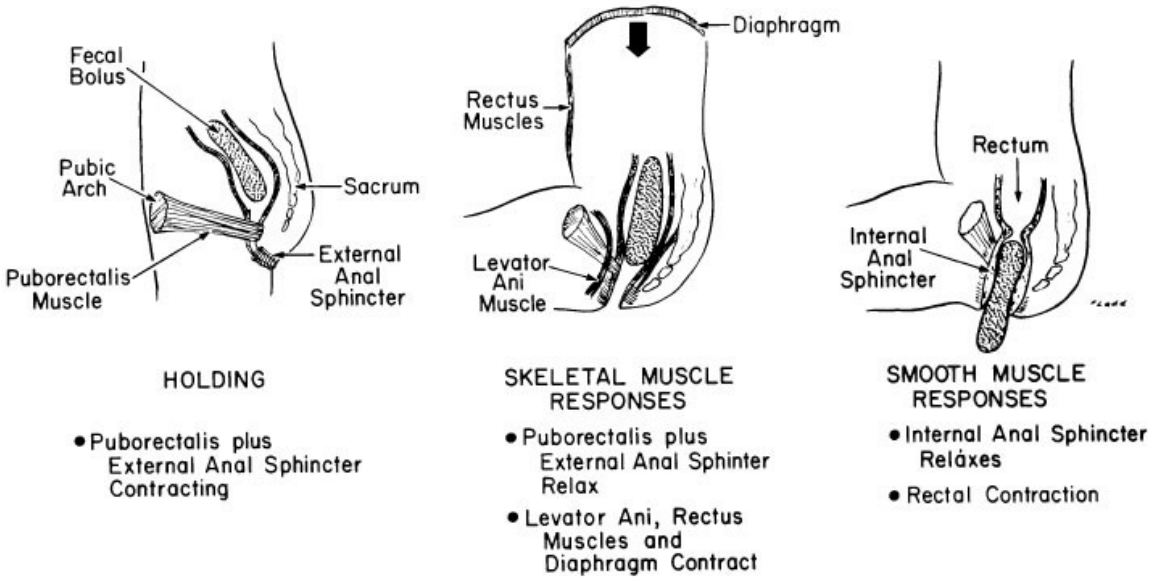


Figure 2: Mechanism of defecation.

Functional bowel disorders

These are disorders that can affect the entire digestive tract from the mouth to the anus. A functional bowel disorder (FBD) is a functional gastrointestinal disorder with symptoms attributable to the mid or lower gastro-intestinal tract, without significant infectious, metabolic or anatomical abnormalities. These include the irritable bowel syndrome (IBS), functional constipation, functional diarrhoea and functional abdominal bloating.

1. **Irritable Bowel Syndrome:** This comprises of a group of functional bowel disorders in which abdominal discomfort or pain is associated with defecation or a change in the bowel habit, and with features of disordered defecation. The cause of IBS is unknown. Emotional factors, diet, drugs, or hormones may precipitate or aggravate heightened GI motility.

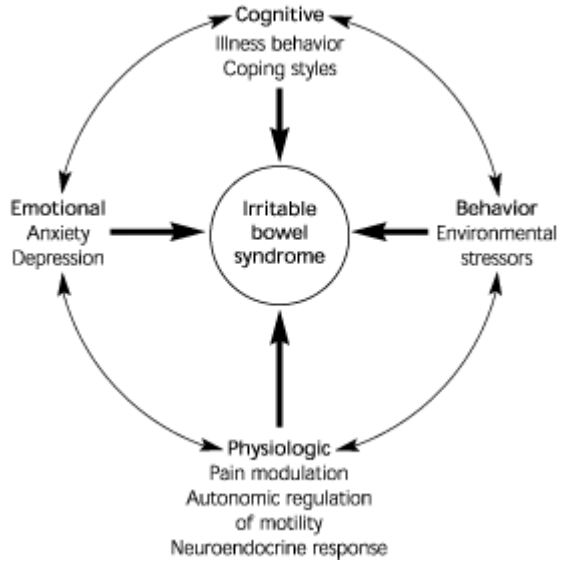


Figure 3. Multicomponent Model of Irritable Bowel Syndrome

Multicomponent model of irritable bowel syndrome (IBS): Development of IBS symptoms can be explained by the interrelation of cognitive, behavior, emotional, and physiologic components (Fig. 3).

In IBS, the circular and longitudinal muscles of the small bowel and sigmoid are particularly susceptible to motor abnormalities. The proximal small bowel appears to be hyper-reactive to food or parasympathomimetic drugs. Small bowel transit is variable in patients with IBS, and changes in bowel transit time often do not correlate with symptoms. Intra luminal pressure studies of the sigmoid colon show that functional constipation can occur when haustral segmentation becomes hyper-reactive (i.e. increased frequency and amplitude of contractions); in contrast, diarrhoea is associated with diminished motor function. Excess mucus production, which often occurs in IBS, is not related to mucosal injury. Its cause is unclear, but it may be related to cholinergic hyperactivity.

Hypersensitivity to normal amounts of intra-luminal distention exists, as does a heightened perception of pain in the presence of normal quantity and quality of intestinal gas. The pain of IBS seems to be caused by abnormally strong contraction of the intestinal smooth muscle or by increased sensitivity of the intestine to distention. Hypersensitivity to the hormones gastrin and cholecystokinin may also be present. However, hormonal fluctuations do not correlate with clinical symptoms. The caloric density of food intake may increase the magnitude and frequency of myoelectrical activity and gastric motility. Fat ingestion may cause a delayed peak of motor activity, which can be exaggerated in IBS. The first few days of menstruation can lead to transiently elevated prostaglandin E2, resulting in increased pain and diarrhoea and is not caused by estrogen or progesterone.

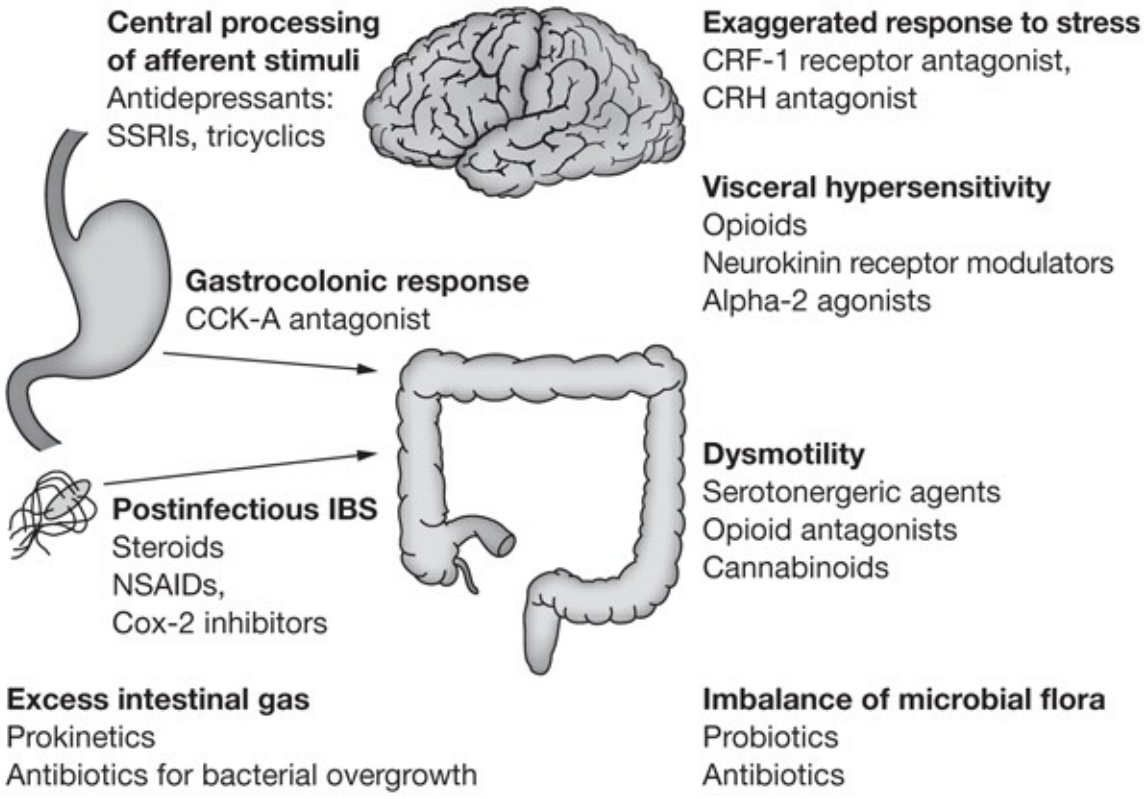
IBS tends to begin in the second and third decades of life, causing bouts of symptoms that recur at irregular periods. Onset in late adult life is rare. Symptoms usually occur in a wakeful patient and rarely manifests in a sleeping patient. Symptoms can be triggered by stress or the ingestion of food. Two major clinical types of IBS have been described-Constipation-Predominant IBS and Diarrhoea-Predominant IBS .The other rare pattern is alternating diarrhoea and constipation type.

Diarrhoea predominant IBS: Usual frequency of stool is more than three times per day, or usual form of stool is loose and not hard, or subjects frequently feel a sense of urgency but do not feel the need to strain to defecate.

Constipation predominant IBS: Usual frequency of stool is less than three times per week, or usual form of stool is hard and not loose, or subjects frequently feel a sense of need to strain to defecate but do not feel the sense of urgency.

Non-specific IBS: These include individuals who do not fulfill the previous 2 categories: i.e. criteria for Diarrhoea Predominant or Constipation Predominant IBS.

Figure 4. Pathophysiology and therapeutic strategies.



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2. **Functional constipation** comprises a group of functional disorders, which presents as persistent difficult, infrequent or seemingly incomplete defecation. There is an overlap between IBS - Constipation type and functional constipation. The pain component, which is predominant in IBS, is absent here.
3. **Functional diarrhoea** is continuous or recurrent passage of loose (mushy) or watery stools without abdominal pain. There is once again an overlap between IBS - Diarrhoea type and functional Diarrhoea.

Functional bowel disorders are common in the West. Data on the normal bowel habit and prevalence of functional bowel disorders amongst the population of the Indian subcontinent is limited.

Literature review

Epidemiology

Normal bowel habits vary considerably from person to person. There are very reports on the normal bowel frequency from India; population based studies are fewer. Most of the studies are from west. In study by Abraham et al [1] from Mumbai, based on a questionnaire survey conducted among the patient's relatives, the normal median bowel frequency in healthy Indian adults was 2 per day. In another study from southern part of Tamilnadu in the city of Coimbatore, the average bowel frequency was once a day.[2]

Prevalence

United States

Several criteria have been designed to define IBS. Depending on the criteria used, worldwide, IBS has been reported in 17-22% of the healthy population, [3-5] chronic constipation in 3-17% [5,6]and chronic diarrhoea in 2-18%.[5,6] A population-based prevalence in USA estimates IBS prevalence to range from 10% to 15%. [5,6] Approximately 12% of these patients are seen in the primary care setting and in 28% of patients seeking subspecialty gastroenterology care.[6] Although IBS affects both sexes, it is largely considered a women's health issue. Epidemiological data [3,7] suggests that the female : male ratio of IBS sufferers in the community is 2-3:1, although estimates differ depending on the practice setting from which such assessments are generated. Generally, two thirds of IBS sufferers in North America who seek medical care are women. [5] Although the minority (25%) of individuals with typical symptoms of the disorder actually does seek medical care, the high prevalence of IBS translates into a sizeable absolute number of patients.[5] Recent reports estimate, physician visits attributable to IBS to be as high as 3.5 million visits annually. Additionally, it has been repeatedly demonstrated that patients with IBS are more likely to seek medical care for other non-GI conditions or physical complaints, such as fibromyalgia or chronic pelvic pain. Bowel frequency was more amongst whites than nonwhites (7.8 vs. 6.0 stools per week, $p< 0.0001$); men reported more frequent stools than women (9.2 vs. 6.7 stools per week, $p< 0.0001$). [8]

To examine the prevalence of gastrointestinal symptoms, Tutega and colleagues[9] reviewed 1069 employees of an integrated healthcare system in Salt Lake City, Utah, 623 of whom responded to a validated questionnaire. They found a striking overlap between IBS and functional dyspepsia: 70% of individuals with IBS also had functional dyspepsia, whereas 43% of subjects with dyspepsia also had IBS. Individuals with overlap consulted a physician more frequently than those who had IBS or dyspepsia alone.[9]

In a community survey from Olmsted County, Minnesota, Locke and colleagues[10] evaluated a similar number of subjects drawn from the general population. Six hundred fifty-seven of 935 eligible subjects responded to a validated questionnaire. The authors of this study found that symptom complex overlap was much more the rule than the exception in this community sample. This applied to IBS with constipation as well as IBS with diarrhoea in terms of an overlap with upper gastrointestinal tract symptoms. It was important to note that there was no predominant pattern of overlap identified consistent with a common underlying pathophysiology. Hence, artificial subdivision of these functional gastrointestinal complaints may not be particularly helpful in terms of patient management. [10]

European countries

In a Spanish study by Roig Vila et al[11] among a working population, the average number of stools was 7.1 $\pm$ 3.3 per week and in 62.4% of subjects the range was 5 and 8. Bowel movements were less frequent in women than in men, nevertheless there were no differences with regard to the age. Laxatives were used regularly by 11.3%. 36% referred straining at stool at least 25% of the times and 8.3% referred straining even for loose stools. Alternating bowel function was present in 19.4% and functional abdominal pain in 28% with a female predominance.

Bassotti et al [12] noted a similar bowel frequency between males and females. The average defecatory

frequency was once per day (range of 0.25-3.25). A higher frequency of straining at stool (P=0.001), a feeling of incomplete emptying and / or difficult evacuation (P=0.0001), and manual maneuvers to facilitate defecation (P=0.046) were reported by females as compared to males.

Zuckerman et al [7] studied the functional bowel disorder pattern among healthy population of whites and Hispanics and found that the frequency of IBS-type symptoms was greater in females than in males. Females reported more alternating bowel pattern (44.0% vs. 28.5%, $P < 0.001$) and constipation (25.5% vs. 12.4%, $P < 0.01$) than males.

South Asian countries

Similar data on the prevalence of functional bowel disorders in Asia are limited. Two studies – one from Thailand and the other from Singapore reported the prevalence of IBS to be lower than those reported in the West [13,14]

In the study from Singapore, [14] the prevalence of IBS, chronic constipation and chronic diarrhoea were $3.2 \pm 2.3\%$, $7.3 \pm 3.5\%$ and $6.9 \pm 3.4\%$, respectively. Women were found to have a lower bowel frequency ($p<0.001$) and a higher prevalence of chronic constipation ($11.3 \pm 6.0\%$ vs. $3.6 \pm 3.5\%$, $p<0.05$) than men. The prevalence of IBS in the general population of Singapore was low compared with those reported in the West In Japan, the normal and diarrhoea responses were significantly more common in men and constipation response was significantly more common in female. [15]

Table 1.Irritabe bowel syndrome : Prevalence studies in Asia

Author	Setting	N	Survey method	IBS definition	Prevalence
Gwee[16]	Singapore	2276	Face to face interview	Manning Rome1 Rome 2	11 10.4 8.6

Xiong[17]	South China	4178	Face to face interview	Manning	11.5
				Rome2	5.6
Lau[18]	Hong Kong	1298	Face to face interview	Rome2	3.7
Kwan[19]	Hong Kong	1797	Phone interview	Rome2	6.6
Danivat[13]	Thailand	1077	Questionnaire	Manning	4.4
Masud[20]	Bangladesh	2476	Face to face interview	Rome1	8.5
Rajendra[21]	Malaysia	949	Face to face interview	Rome2	14
Pan[22]	China	2486	Questionnaire	Manning	7.3
				Rome1	0.8
Ho[23]	Singapore	696	Face to face interview	Manning	2.6

Diet and IBS

Saito and colleagues [24] presented their findings from a case-control study conducted in Olmsted County comparing dietary consumption of specific nutrients in subjects who had a presumed functional gastrointestinal disorder with controls (i.e. those without symptoms). A validated food frequency questionnaire was applied. Patients with functional gastrointestinal symptoms consumed a higher percentage of fat, but there were no other major differences observed between the 2 groups, although there was a modestly lower percentage of carbohydrate, vitamin C, and sugar consumed by individuals with functional gastrointestinal complaints.

In a study to find out the absolute fiber intake from different sources of food items in patients with IBS and healthy subjects Malhotra et al [25] from Chandigarh, India found that the total dietary fiber intake and intake of fiber from vegetables, fruits and pulses were lower in patients with IBS than in control subjects**.**

Because there are no discrete physical abnormalities or biochemical/serological markers that define IBS, this condition has historically been viewed by many clinicians as a diagnosis of exclusion. This view, coupled with the increasing number and cost of available diagnostic studies, has resulted in extensive and unnecessary testing. An exhaustive exclusionary diagnostic evaluation, especially in patients with typical IBS symptoms without alarm features (age ≥ 50 years, fever, abnormal physical examination findings, haematochezia, unintentional weight loss, nocturnal symptoms, or a family history of organic GI disease), contributes to an

increased burden on both patients and the medical system, and recently has been challenged regarding its usefulness in the management of such patients.[26]

Diagnosis

The economic burden associated with IBS, both direct and indirect, is substantially high with frequent physician visit, absenteeism from work, decreased work output. To mitigate some of the costs associated with IBS, accurate and timely diagnosis is an important consideration. For IBS, applying clinically proven symptom-based diagnostic criteria to make a positive, rather than exclusionary, diagnosis is an important step in the right direction to reduce the overall cost.

A diagnosis of IBS is based on identifying positive symptoms consistent with the condition, and excluding, in a cost-effective manner other conditions with similar clinical presentations, which may include organic or other functional (e.g., functional diarrhoea or bloating, pelvic floor disorders, or slow transit constipation with associated abdominal discomfort relieved with defecation) disorders.

Multiple symptom-based criteria have been developed: Manning, Kruis, Rome, Rome I and Rome II criteria.

Symptom-based criteria [27]

Manning criteria for diagnosis of IBS

1. Abdominal pain relieved by defecation
2. Looser stools with the onset of pain
3. More frequent stools with the onset of pain
4. Abdominal distention
5. Passage of mucus in stools
6. Sensation of incomplete evacuation

Rome I Diagnostic Criteria for Irritable Bowel Syndrome

At least 3 months of continuous or recurrent symptoms of the following:

- Abdominal pain or discomfort
- Relieved with defecation, or
- Associated with a change in frequency of stool, or
- Associated with a change in consistency of stool

Two or more of the following, at least on one-fourth of occasions or days:

- Altered stool frequency (for research purposes altered may be defined as more
- than three bowel movements each day or less than three bowel movements each week), or
- Altered stool form (lumpy/hard or loose/watery stool), or
- Altered stool passage (straining, urgency, or feeling of incomplete evacuation), or
- Passage of mucus, or
- Bloating or feeling of abdominal distention

Rome II criteria

At least 12 weeks, which need not be consecutive, in the preceding 12 months of abdominal discomfort or pain that has 2 of 3 features:

- Relieved with defecation; and/or
- Onset associated with a change in frequency of stool; and/or
- Onset associated with a change in form (appearance) of stool.

Symptoms that cumulatively support the diagnosis of IBS:

- Abnormal stool frequency (for research purposes, ‘abnormal’ may be defined as greater than three bowel movements per day and less than 3 bowel movements per week);
- Abnormal stool form (lumpy/hard or loose/watery stool);

- Abnormal stool passage (straining, urgency, or feeling of incomplete evacuation);
- Passage of mucus;
- Bloating or feeling of abdominal distention.

Among the commonly symptom based criteria, Manning criteria has been the most extensively evaluated and it is the only diagnostic criteria that has been evaluated in clinical studies. [28] Manning criteria has a positive predictive value of only 65-75%. [29]

The primary reason why Rome criteria was introduced was to provide a uniform. framework for selecting patients with functional GI disorders for clinical research. In recent years the extension of the Rome criteria to routine clinical practice has been encouraged. [30] Rome II criteria have the advantage of being easier to recall than the older Manning or Roman criteria. When "alarm features" such as weight loss, refractory diarrhoea, and family history of colon cancer are excluded, the specificity of the symptom-based Rome I criteria for IBS exceeds 98% and hence, the risk of missing organic disease is low. [31] In a recent study from South India among IBF patients Banerjee et al[49] showed that ROME I criteria are more sensitive than ROME II for diagnosis of irritable bowel syndrome in Indian patients.

Evaluation

A detailed physical examination is essential on the first and on subsequent visits as needed. Review of the case during subsequent visits is essential so as to avoid missing an organic disease e.g. enlarged liver, abdominal mass, signs of bowel obstruction. Also this would envisage patient's expectations of a thorough clinical evaluation. A pelvic examination is often indicated for lower abdominal / pelvic symptoms and/or if there is a change in menstrual pattern. A rectal examination, particularly for patients reporting symptoms of incontinence or dyschezia, can help to identify a lax sphincter or paradoxical pelvic floor muscle contraction. This may require anorectal testing of pelvic floor muscle function.

In general, if Rome criteria are fulfilled, “alarm signs” or “red flags” are not present, and screening studies from the referring physician are negative, further testing is not needed. Screening studies are recommended when certain historical information is present [32]

(1) Short symptom duration or worsening severity and refractory symptoms,

(2) Demographic features (e.g., onset in an older patient),

(3) Family history (e.g., colon cancer or inflammatory bowel disease), and

(4) No concurrent psychosocial difficulties or symptom behavior (particularly the absence of co morbid psychosocial features or health care seeking).

Tolliver et al [33] examined the use of faecal occult blood testing (FOBT) in patients with suspected IBS. Fifteen of 183 patients (8.2%) had a positive FOBT and subsequently underwent full colonoscopic examination. Four of the 15% with positive FOBT or 2.2% of the original cohort had structural abnormalities identified in colonoscopy. None of these findings were felt to represent an alternative diagnosis nor were these findings felt to provide an explanation for the patients IBS symptoms. [33]

Examination of stool for ova and parasite is another commonly recommended test for patients with suspected IBS. Hamm [34] found that 1.7% of patients with suspected IBS had an evidence of intestinal pathogen on standard stool O & P examination. Tolliver [33] performed stool O&P examination in 170 patients with suspected IBS and found no subjects with evidence of enteric infection.

AGA (American Gastroenterology Association) recommends [35] a complete blood count and a stool hemoccult for screening purposes. Sedimentation rate (particularly in a younger patient), serum chemistries, thyroid-stimulating hormone (TSH), and stool for ova and parasites are other baseline investigations and are tailored based on symptom pattern, geographic area, and relevant clinical features (e.g., predominant diarrhoea, areas of endemic infection).

In a trial by Tolliver[36] et al CBC and serum chemistries were performed in 196 patients in suspected IBS. In this trial the results failed to result in an alternative diagnosis of organic GI disease in any patient. Studies do not generally support a role for these tests without supportive clinical features. [37]

Prevalence of lactose malabsorption is estimated to be 25% in western countries and perhaps as high as 75% worldwide. In the study by Tolliver [33], 186 patients with suspected IBS had hydrogen breath test. The author found a similar prevalence of lactose malabsorption with 25.8% (48 out of 186) of the cohort having abnormal results. On follow-up these patients with lactose malabsorption did not differ with respect to the ongoing GI symptoms when compared with patients without evidence of lactose malabsorption. [33] The clinical impact of identifying lactose intolerance in IBS patients remains unclear.

Francis et al [38] evaluated the role of ultrasound (US) to identify serious abdominal or pelvic pathology in 125 patients with suspected IBS and found 20% of women and 8% of men had some abnormality in US. But in none of them were the authors able to correlate the abnormalities identified on US to the patient with GI symptoms. They concluded that US was not necessary in suspected IBS when diagnosed by symptom criteria.

Few studies have evaluated the yield of endoscopic investigations in suspected IBS. Hamm [37] examined 306 patients and found four patients (1.3%) had an alternative diagnosis (IBD in 3 patients, colonic obstruction in one) that might have been the cause for the GI symptoms. Tolliver [33] performed similar analysis in 199 patients and found 42 colonic structural abnormalities in 34 subjects. Of these only 2 patients (1%) were found to have an organic disease (IBD-1, Cancer-1) that could have been potential causes of IBS symptoms. A colonoscopy is recommended for patients over the age of 50: at least in the West (due to higher pretest probability of colon cancer), but in younger patients, performing a colonoscopy or sigmoidoscopy is determined by clinical features suggestive of disease (e.g., if there is significant diarrhoea) and may not always be indicated.

Table 2. Pretest probability of organic gastrointestinal disease in patients meeting symptom-based criteria for IBS. [39]

Organic GI disease	IBS patients (pretest probability)	General population (prevalence)
Colitis/IBD	0.51-0.98%	0.3-1.2%
Colorectal cancer	0-0.51%	4-6%
Gastrointestinal infection	0-1.7%	N/A
Thyroid dysfunction	6%	5-9%
Lactose malabsorption	22-26%	25%

There has been growing interest in the use of antiendomysial (EMA) and antigliadin (AGA) antibodies to diagnose celiac sprue.[40,41] Using decision analytical modeling Mein et al [42] concluded testing patients with suspected IBS with either tissue

transglutaminase antibodies (TTg) or antibody panel (TTg, AGA, IGA) was highly cost effective. In a sensitivity analysis TTg testing remained cost effective in patients with suspected IBS as long the prevalence was >1.1%. However, such testing must be put into a clinical perspective as determined by presence of symptom pattern, ethnicity, and other clinical features suggestive of the disease and most importantly prevalence of the disease in that particular region. [41]

In many situations, a therapeutic trial can be undertaken before further diagnostic studies are done and this would depend on the symptom subtype and its severity. For constipation: a trial with dietary fiber, or an osmotic laxative; for diarrhoea: loperamide, or diphenoxylate-atropine and possibly cholestyramine; and for pain/gas/bloating: an anticholinergic, or, if more severe, antidepressant or psychologic treatment may be considered. It needs to be emphasized that patients presenting with typical symptoms and no "alarm" signs are rarely found to have another diagnosis, [37] supporting the benefit of ongoing care and symptomatic management rather than continued diagnostic evaluation.

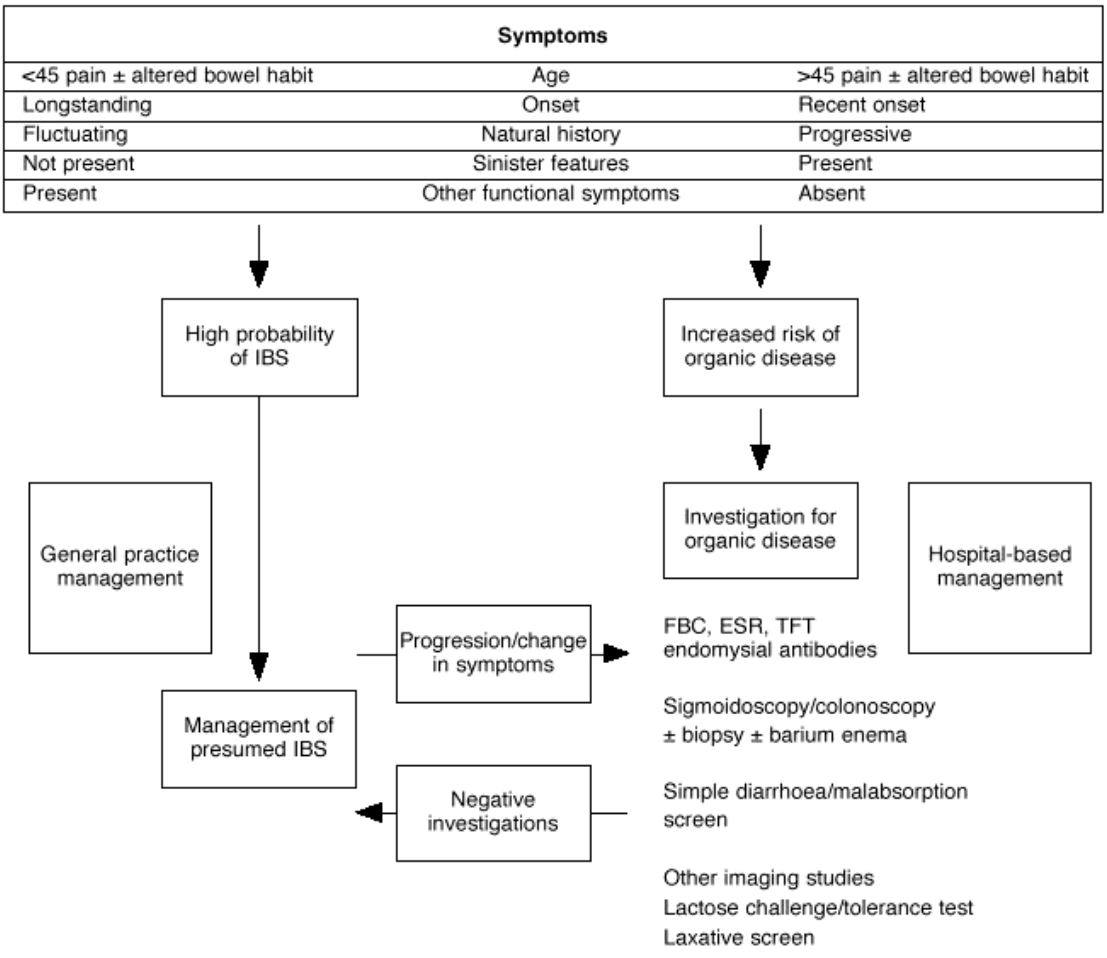
If initial treatment fails, or certain clinical features emerge requiring further evaluation, AGA recommend further evaluation. Gastroenterologists in specialty centers perform several of these studies.

In patients with infrequent bowel movements, whole gut transit study by Sitzmark technique or a plain radiography (to evaluate for obstructive signs or fecal retention) is indicated. When symptoms of dyschezia or incomplete evacuation are prominent, suggesting obstruction to defecation, or when the physical examination discloses poor pelvic floor relaxation with straining, further anorectal testing is indicated. This includes anorectal motility testing with balloon expulsion (to evaluate for pelvic floor dyssynergia) or defecography (to evaluate for enterocele or rectocele).

If diarrhoea is persistent, other tests to consider include: 24-hour stool volume and fat; if increased (>400 ml/day), electrolytes and laxative screen; and small bowel biopsy for giardia lambia or sprue and colonic biopsy for microscopic colitis is recommended. On occasion, transit tests of the small bowel and colon can help evaluate the severity of the motility component of the diarrhoea. A therapeutic trial of cholestyramine may also be considered, particularly if symptoms developed or worsened after a cholecystectomy. A jejunal biopsy and aspirate can be done to obtain samples to assess malabsorption (e.g., sprue), or to obtain an aspirate for giardia or for bacterial overgrowth. Colonic biopsies can be considered to evaluate for collagenous or lymphocytic colitis, although the findings may not lead to instituting more effective treatment. Finally, when postprandial symptoms of bloating and gaseousness accompany the diarrhoea, a breath H_2 study to exclude bacterial overgrowth can be considered. [43]

The persistence of pain-predominant symptoms or severe bloating usually requires plain abdominal radiography during an acute episode to exclude bowel obstruction, an increased gastric air bubble from aerophagia, and/or other abdominal pathology. If negative, additional imaging studies (e.g., small bowel radiography, computerized tomography scan, pelvic ultrasonography) may be recommended, particularly when there are other symptoms or signs present (e.g., vomiting, weight loss, abdominal mass, irregular menses, abnormal chemistries). A balloon distention test may confirm rectal or colonic visceral hypersensitivity, although this test is usually done for investigative purposes.

Figure 5: Algorithm for evaluation of IBS patients BSG proposed guidelines



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Though plenty of literature is available from the west, data on normal bowel habit and pattern of functional bowel disorder is scarce from the Indian subcontinent. An earlier retrospective study from South India had refuted the applicability of Rome criteria in patients with IBS.[47] (Jayanthi et al) A prospective study is likely to clearly define the applicability or non-applicability of popular ROME criteria.

Aim of the study

1. To define the bowel frequency / habits in the general population of South India and to determine the prevalence of Irritable bowel disorder and its subtypes in the population.
2. To identify prospectively the bowel pattern in irritable bowel syndrome in gastroenterology referral practice at a tertiary center.
3. To propose guidelines for diagnosis of IBS in south Indian patients.

MATERIALS AND METHODS

The study was divided into two parts:

A: Study of normal bowel pattern in healthy south Indian population

B: Prospective study of bowel pattern in IBS

A) Study of normal bowel pattern

The study group consisted of healthy population belonging to either sex and age between 15 yrs and above and less than 70 yrs and who were residents of North Chennai for minimum period of one year. Extremes of age were excluded because of possibility of unsettled bowel habits in younger age and physiological problems of aging and poor recall in the elderly. All the individuals were interviewed for their perception of bowel movements and the reply was documented in a prestructured questionnaire (Annexure I). Details apart from demographic and socio economic characteristics included social habits such as smoking and drinking pattern, bowel movement details such as the frequency, consistency, straining during bowel movement and satisfaction of bowel emptying. Any change in the consistency of stools or a change in bowel habit in the preceding year, if any, was documented. The stool form was determined by showing Bristol stool form scale. (fig.6) Finally, the individuals were questioned whether they considered themselves normal or not.

B: Study of bowel pattern in IBS

Individuals amongst the healthy population in whom the bowel pattern was considered as abnormal, and in those who had an alteration in bowel symptoms for a period of more than 3 months with or without abdominal pain probably had an IBS and were considered for further evaluation. These patients along with cases diagnosed as IBS between Jan 2004 and June 2005 were analysed for the pattern of bowel movement. All these patients with a clinical diagnosis of IBS had a detailed

questionnaire completed (Annexure II). The data obtained included basic demographic characteristics such as social habits: alcohol, smoking, literacy status, sleep pattern: normal/disturbed, stress: at home/ place of work; duration of symptoms and details pertaining to the bowel habits:

i. Abdominal pain: location, duration,

ii. Stool form (Bristol stool scale), frequency

iii. Relationship of abdominal pain to act of defecation

iv. Incomplete evacuation

v. Presence or absence of mucus in stool

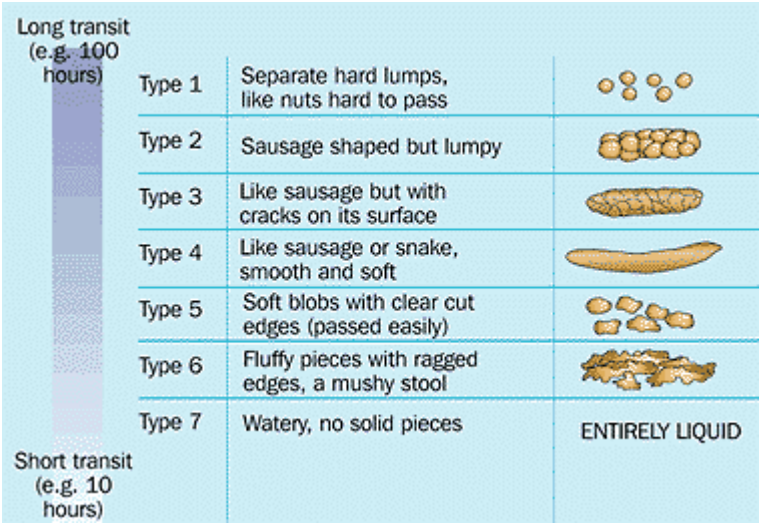
vi. Urgency

Absence of pain was not an exclusion criteria. Other patient details included ability to cope with stress at home or at place of work and sleep pattern : early morning wakefulness, late onset of sleep, symptoms pertaining to the upper GI tract such as ulcer-like, dysmotility like, reflux like dyspepsia, genitourinary symptoms.

All these patients had a detailed physical examination followed by basic investigations such as blood counts, blood sugar, stool microscopy, thyroid function tests, duodenal biopsy (rule out small bowel cause for diarrhoea) and sigmoidoscopy/colonoscopy based on the department protocol to rule out organic diseases.

The analysis was done to obtain the prevalence of various symptoms in the diarrhoea predominant, constipation predominant and combination type.

Figure 6. Bristol stool scale.



Diarrhoea predominant IBS subgroup was defined if the usual frequency of stool was >3 times per day, or the usual form of stool was loose and not hard, or the subjects frequently felt a sense of urgency but did not feel the need to strain to defecate

Subjects were classified as constipation predominant IBS subgroup if the usual frequency of the stool was<3 times per week, or the usual form of stool was hard and not loose or the subjects frequently felt the need to strain to defecate but did not feel the sense of urgency.[44]

Non-specific IBS subgroup subjects were those who did not fulfill the above criteria for diarrhoea or constipation predominant IBS subgroups.

Exclusion criteria

Individuals with alarm symptoms such as bleeding per rectum, anemia, weight loss, anorexia, nocturnal symptoms, recent change in bowel pattern, post operative cases including post

hemorrhoidectomy, fissure in ano, those on antidepressants, recently detected hypothyroid state, diabetes mellitus, or following radiotherapy were excluded from the study. A minimum duration of change in bowel habits of 3 months was considered necessary for inclusion in the study protocol.

Formal ethics committee approval of the Institution was obtained. Informed consent was obtained for the IBS individuals detected from amongst the healthy population for further evaluation.

Statistical Analysis

A two-way factor analysis for demographic characteristics and bowel pattern was done using Pearsons Chi Square test, Yates corrected Chi Square test and independent student t test wherever appropriate.

RESULTS

A: Normal bowel movement in healthy population:

A total of 841 individuals were contacted for the normal bowel habit questionnaire. 89 individuals refused to participate. Overall response rate was 89.4%. There were 392 male and 360 female individuals (M: F ratio: 1.1:1).

Tab 3. Age, Sex distribution of general population

Age group	Sex	
	Male (%) 392	Female (%) 360
15-29 (No=198)	105(26.7)	93(25.8)
30-44 (No=343)	**174(44.3)**	**169(46.9)**
45-59 (No=81)	44(22.2)	37(10.2)
≥60 (No=130)	69(17.6)	61(16.9)

Table 3 summarizes the age, sex distribution of the population under study. Majority of the individuals were middle aged (46.9%)

Figure 7. Bowel frequency in general population

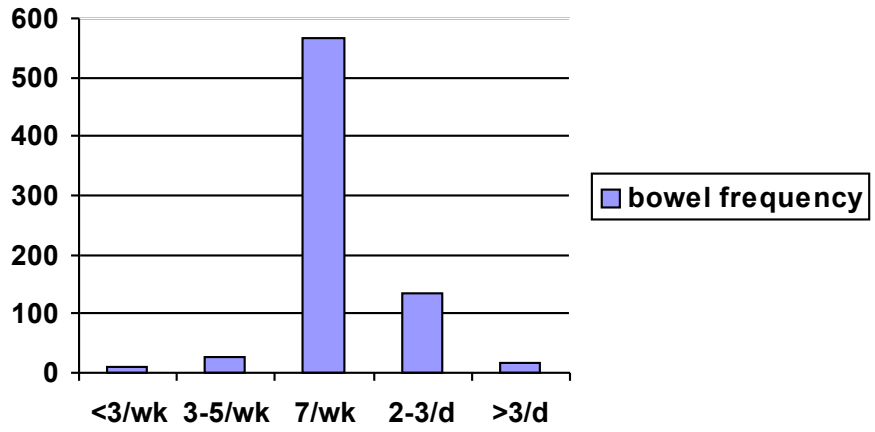


Figure shows the bowel frequency in men and women per day per week. The average frequency was at least once a day. The average frequency of bowel movement in the south Indian population of North Madras was 8.9 $\pm$ 4.8 per week. Stool frequencies between 3 times a week and 3 times a day was seen in majority of our respondents (95.8 %) (Fig.7). 75% reported a single bowel movement, followed by 2-3 times a day in 18%. Twenty six persons (3.4%) had 3-5 stools/week, 16 persons i.e. 2.1% had more than 3 stools per day and 10 individuals i.e. 1.3% had less than 3 per week. The median bowel movement was seven per week.

Tab 4. Bowel frequency in our population: sex distribution

Sex	Bowel frequency				
	1/d (%)	2-3/d (%)	>3/d (%)	3-5/wk (%)	<3/wk (%)
Male (No=392)	295 (75.2)	72 (18.3)	9 (2.2)	13(3.3)	3 (< 1)
Female (No=360)	270 (75)	63(17.5)	7 (2.0)	13(3.6)	7(2.0)

The frequency of less than 3 per week was common amongst women. In the rest no difference in frequency was noted amongst the two genders. (Table 4)

Tab 5 Bowel frequencies in general population: age distribution

Age group	Bowel frequency				
	1/d	2-3/d	>3/d	3-5/wk	<3/wk
15-29 (No.) % (No=198)	48(74.7)	37(18.6)	4(2)	7(3.5)	2(1)
30-44 (%) (No=343)	247(72)	67(19.5)	7(2)	14(3.9)	8(2.3)
45-59 (%) (No=81)	66(81.4)	10(12.3)	2(2.4)	3(3.7)	None
≥60(%) (No=130)	104(80)	21(16.1)	3(2.3)	2(1.5)	None

Table 5. shows the bowel frequency in different age groups. The frequency of at least once a day was common to all the age groups. Bowel frequency of < 3 per week was common in middle age group.

B. Study of bowel movement in IBS:

From amongst the healthy population there were 38 individuals who had features of IBS i.e. **5.1%.** There were 26 men and 12 women patients. These individuals had considered themselves as normal as far the bowel movements were concerned. However, they had an altered bowel pattern in the form of altered frequency/form and with or without abdominal pain (Rome Criteria II). In addition there were 144 cases of newly diagnosed IBS during the study period. The combined results of 182 cases of IBS will be highlighted from here on.

Tab 6. Age-Sex distribution in IBS

Age group	Total	Male	Female
≤20	5	3	2
21-40	108	82	26
41-60	52	31	21
>60	17	12	5
Total	182	128	54

Table 6 summarizes the age-sex distribution in IBS. There were 128 men and 54 women (M:F ratio:2.4:1). Majority of the patients were in the middle age group i.e., 3rd and 4th decades. The mean age for males was 37.7 ±14.3 yrs and for females was 37 ±14.91yrs.

Tab 7. Other demographic characteristics in IBS

Variables	Controls (%) 714	IBS (%) 182	p value
Smoking	46(6.4)	19(10.4)	0.06
Alcohol	30(4.2)	24(13.1)	0.001
Disturbed sleep	160(22.5)	55(30.2)	0.03

Table 7 shows the social characteristics in IBS in comparison with the healthy controls. Smoking, alcoholism and disturbed sleep were higher in IBS patients, the latter two were statistically significant.

Tab 8.Duration of illness and age of patients

Age group	3-6 mo	6-12 mo	1-5 yrs	6-10 yrs	>10yrs
<20 yrs	2	2	1	0	0
21-40 yrs	9	34	42	17	6
41-60 yrs	3	14	18	9	8
>60 yrs	1	4	5	2	5
Total	15(8.3)	54(29.8)	66(36.1)	28(15.2)	19(10.3)

Majority of the patients with IBS had symptoms between six months and five years (66%) before consulting a physician.

Tab 9. Lower GI symptoms in IBS

Variable	Total (%) 182	Male (%) 128	Female (%) 54	p value
Pain	76(41.7)	55(42.9)	21(38.8)	NS
Frequency >3/rd	125 (68.6)	95(74)	30(55)	0.01

Frequency<3/wk	18(9.8)	8(6.2)	10(18.5)	0.01
Loose stools	127(69.7)	96(75)	31(57.4)	0.01
Hard stools	24(13.1)	12(9.3)	12(22.2)	0.02
Urgency	35(19.2)	21(16.4)	14(25.9)	NS
Straining	54(29.6)	34(26.5)	20(37)	NS
Incomplete evacuation	57(31.3)	39(30.4)	18(33.3.)	NS
Mucus	46(25.2)	30(23.4)	16(29.6)	NS
Bloat	54(29.6)	34(26.5)	20(37)	0.07

Table 9 shows the various lower GI symptoms in IBS. Loose stool (69.7%) and increased frequency (68.6%) were the common symptoms followed by abdominal pain in 41.7%. Loose stool and increased frequency were common among males which were statistically significant. Hard stools (13.1%) and frequency of less than 3 per week (9.8%) was an uncommon presentation, but was statistically more common among females.

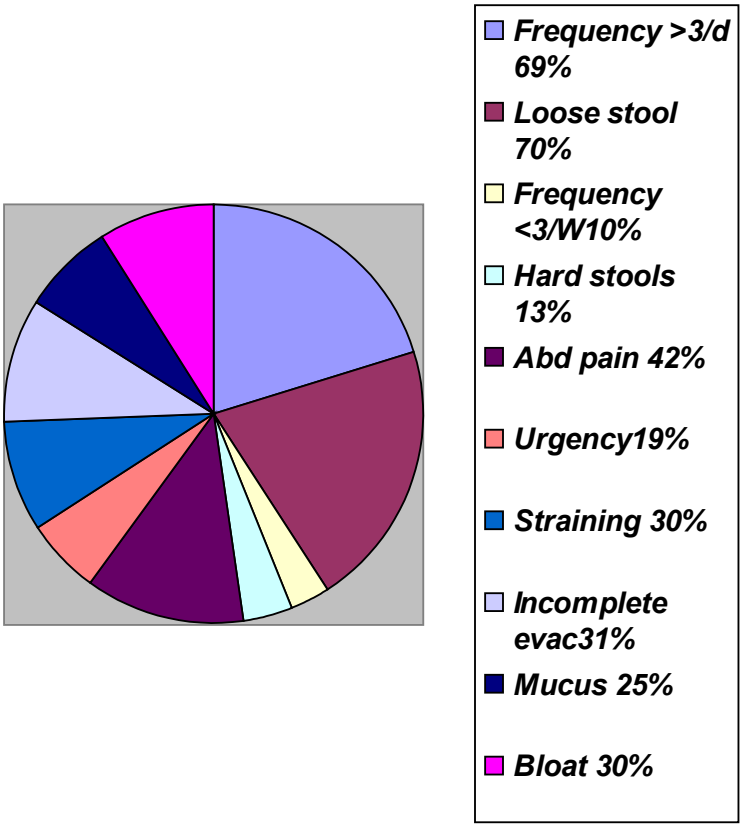


Fig.8. Lower GI symptoms in IBS

The figure 8 shows the pictorial representation of various lower GI symptoms in IBS. The loose stools (70%), increased frequency (69%) being the common presentation followed by Abdominal pain (42%)

Tab 10. Age - sex wise distribution of bowel **frequency** in IBS (M:F=128:54)

Age	>3 / day		≤3 / day to ≥3 / wk		<3 / wk	
	M	F	M	F	M	F
< 20 yrs (5)	2	0	1	1	0	1
21-40 yrs (108)	63	19	13	8	3	2
41-60 yrs (52)	23	10	9	4	2	4
>60 yrs (17)	7	1	2	1	3	3

Table 10 shows the frequency of stools among the IBS patients with regard to age and sex. The frequency of less than 3 per day was common in the older age group (> 40 yrs) and in female sex. Increased frequency of stools was common among men of all age groups.

Tab 11. Age and sex wise distribution of **stool form** in IBS (M:F=128:54)

Age	Loose (Bristol 6,7)		Normal (Bristol 3,4,5)		Hard (Bristol1,2)	
	M	F	M	F	M	F

≤ 20 yrs (No=5)	2	0	1	1	0	1
21-40yrs (No=108)	58	22	11	6	7	4
41-60yrs (No=52)	25	11	5	3	4	4
>60yrs (No=17)	8	1	3	1	1	3

Table 11 shows the consistency of stools among the IBS patients with regard to age and sex. Hard stool was common among females . Loose stools were more common among men.

Tab 12.Comparison between **frequency vs. consistency** of stool in IBS

Frequency of stool	Consistency of stool		
	Loose	Normal	Hard
>3/day	123	2	None
≤3/day to ≥3/wk	4	27	8
<3/wk	None	2	16

Table 12 shows the comparison between loose stools and frequency of stools. The frequency of stools correlated well with the consistency. 123 patients had frequency of more than 3 per day and the stools were loose. 16 patients who had a frequency of less than 3 per week passed hard stools.

Tab 13. Prevalence of IBS and its subtypes

IBS subtypes	No (%)	M(%)	F(%)	p value
Diarrhoea predominant (IBS-D)	139(76.4)	109(85)	30(55)	0.001
Constipation predominant (IBS-C)	30(16.5)	14(11)	16(30)	0.001
Non-specific (IBS-N)	13(7.1)	5(4)	8(15)	0.01

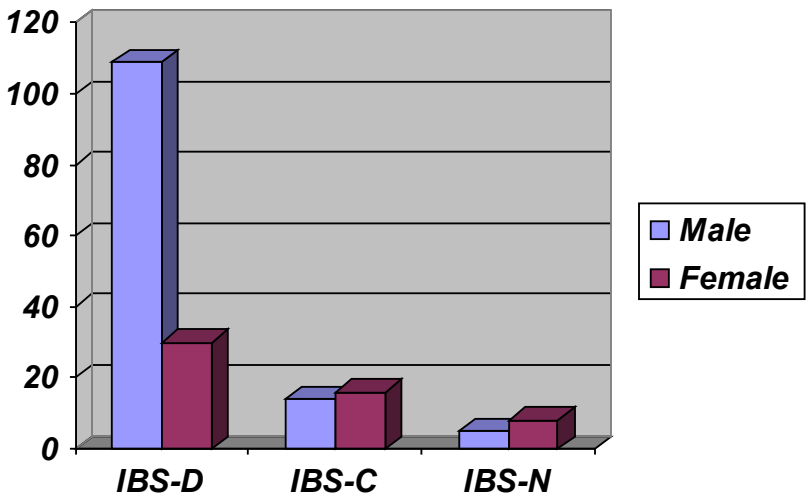


Figure 9. IBS subtypes

On symptom analysis, there were 139 cases (76.4%) of Diarrhoea predominant IBS, 30 cases (16.5%) of Constipation predominant IBS and 13 cases (7.1%) of nonspecific type IBS. The Diarrhoea predominant IBS was common among males and the constipation predominant and non specific types were common among females both were statistically significant.

Tab.14. Diarrhoea predominant IBS: Patient characteristics (Total=109)

Table 14 shows the patient characteristics of Diarrhoea predominant IBS. The mean age of men and women were 37.6±15.6 and 41.6±12.1 years and this was statistically significant for women. There was no significant difference between either sex in any of the other demographic characteristics such as literacy status, sleep pattern and dyspepsia, genitourinary symptoms. There were no women smokers or alcoholics.

Tab 15.Constipation predominant IBS : Patient characteristics (Total=30)

Table 15 shows the patient characteristics of Constipation predominant IBS. The mean age of men and women were 35.4±9.8 and 39.3±7.2 years, this was not statistically significant. There was no significant difference between male and female in any of the other demographic characteristics such as literacy status, sleep pattern and dyspepsia, genitourinary symptoms. There were no women smokers or alcoholics.

Tab 16. Comparison of bowel pattern in Diarrhoea predominant and Constipation predominant –IBS.

Table 16 shows the other lower GI symptoms associated with IBS patients. Abdominal pain relieved with defecation and associated with change in form/frequency were equally present between diarrhoea and constipation predominant IBS. Incomplete evacuation, straining and bloating were significantly common among constipation predominant IBS. Urgency and mucoid stool were common among diarrhoea predominant group though statistically not significant.

DISCUSSION

The prevalence of bowel symptoms has important implications for the allocation of resources and planning of medical services. These data have been used to define a normal range of bowel frequency and to estimate the prevalence of IBS-type symptoms and other bowel dysfunction symptoms in the general population world over. Normal bowel patterns have been established in western population. Similar studies in Indians are lacking. In a Spanish study by Roig Vila et al[11], the average number of stools was 7.1± 3.3 per week and in 62.4% of subjects the stool frequency was between the range of 5 and 8. In a study by Abraham et al [1] from Mumbai, the median bowel frequency in Indian adults was 2 per day. In an earlier study from Coimbatore, Jayanthi et al [2] reported an average bowel frequency of once a day amongst the college students, and healthy attenders of hospital patients. In the present study, consisting of a population from North Madras, Chennai, the median frequency of bowel movement was one per day similar to the other studies from Tamil Nadu. The mean frequency was 8.9 ± 4.8 per week. In a Spanish study by Roig Vila et al[11], the bowel movements were less frequent in women than in men, nevertheless there were no differences with regard to age. Similarly in the present study except for constipation which was higher among females, there was no difference in bowel frequency with regard to the different age groups. The present data cannot be extrapolated to the entire population of Tamil Nadu or the entire country. Large population based studies from different parts of India, including urban and rural

population will ultimately give information of the actual bowel pattern in the Indian subcontinent. What is true of a normal bowel movement for Northern or other parts of India may not hold true for our population, largely because of the varying social and cultural, dietary differences etc.

IBS is a well recognized clinical entity in the Western population. Large population based epidemiological surveys in the United States [5] and the United Kingdom [3] have reported the prevalence to range from 17 to 22%, based on either Manning criteria or Rome criteria. In Kwans et al [19] study from Hong Kong the prevalence of IBS in the general population was 6.6% and in another survey amongst medical students from Malaysia[37] a high prevalence of 15.8% was reported. In the present study, using the same criteria, the prevalence of IBS amongst the healthy population was 5.1%. The results are consistent with the findings of a community-based survey in Singapore, wherein the reported prevalence rate was of 2.3%. [14] A study from Thailand amongst thousand rural villagers and hotel employees, [13] 4.4% had symptoms of IBS. The south Asian prevalence of IBS amongst the healthy population is similar to southern India. The high prevalence in one of the Malaysian studies is probably the bias towards the affluent class of medical students, a highly stressed group and the likelihood of awareness of somatic symptoms. In previous studies on the prevalence of IBS the study group consisted of a small population and therefore does not truly reflect the prevalence in the community. Despite this, it appears that the IBS prevalence in southern India is similar to the other south Asian countries.

The community prevalence of IBS appears to be definitely lower in the East than the West. The reason for this difference is unknown and requires further study. The dietary factors such as an increased intake of fibers and low fat content in the food may be contributory.

Although IBS affects both genders, it is largely a problem amongst women in the western population. Epidemiological data suggests that the female: male ratio of IBS sufferers in the community is 2-3:1,[3,7] although estimates differ depending on the practice setting from which such assessments are generated. Generally, however, two thirds of IBS sufferers in North America who seek medical care are women.[5] In the present study, IBS was more common among men in the ratio of 2.4:1 with a male predominance in contradiction to west. An earlier study in 1996, [47] which looked into the

bowel pattern of IBS patients, the males were predominantly affected. The differences in health care-seeking behavior, awareness and education status among male, may partly account for this predominance.

IBS commonly involves the middle age group. Average age group of IBS individuals in the study population was 37.7 ± 15.2 years, similar to the report from Hong Kong by Kwan et al [36] of 39.8 years. In the present study there was no significant difference among subjects with different education levels. Kwan et al[36] found no significant difference among subjects with different education levels.

Smoking and alcohol consumption was present only amongst men in the IBS group and this was statistically higher amongst the IBS patients. In the Malaysian study[45] there was no differences in the alcohol intake, smoking habit, chilli consumption or fibre intake between IBS and non-IBS groups. Sleep pattern disturbances was higher in IBS population in the present study. A similar observation was made by Tan et al [45]. He reported a high prevalence self reported psychological and psychosomatic symptoms, namely anxiety, depression, and insomnia.

Tutega et al [9] found a striking overlap between IBS and functional dyspepsia:
70% of individuals with IBS also had functional dyspepsia, whereas 43% of subjects with dyspepsia also had IBS. In our study the prevalence of dyspepsia in IBS was 36.8%, which was significantly higher than in the general population. IBS patients have the
dysmotility "abnormalities" in 25%–75% as evidenced by a delayed emptying especially
for solids. One–fourth of patients with IBS and co-morbid dyspepsia had electrogastrogram abnormality, but was present in only 8% of IBS without dyspepsia, [35] indicating that motility abnormalities are not uncommon in IBS population.

Symptom subgroups based on predominant bowel habit showed the majority of individuals with IBS had diarrhoea predominant subtype (76.4%) with predilection for male sex. The constipation predominant group was 16.5% and the non-specific sub type in 7.1%. This is in contradiction to the previous studies. In the Malaysian study [45] and a study by Mearin et al,[46] the constipation predominant IBS was the predominant subtype . Constipation predominant IBS was more common in females in the present study. In Kwans[19] study interestingly the nonspecific IBS subtype was predominant with 56% followed by diarrhoea predominant i.e. 27% and constipation predominant with 17%. The nonspecific form was not prominent in the present study, since most patients had either diarrhoeic or constipated form and very few had a combination of both.

The prevalence of bowel symptoms arranged in descending order was: Loose stools (69.7%),increased frequency of stools (68.6%), abdominal pain (41.7%), incomplete evacuation (31.3%), bloating and straining (29.6%) mucus in stools (25.2%) urgency (19.2%), and hard stools (13.1%), decreased frequency of stools(9.8%)**.** This study shows that loose stool with increased frequency was the common symptom in IBS compared with the pain predominant type in the west. This was similar to the previous study from Chennai[47] where the abdominal pain was uncommon (35%) and loose stool the predominant symptom (75%). There was significant difference between male and female with loose stools and increased frequency were common among males and hard stools and frequency <3/week were common in females that is statistically significant. Similar data are not available from rest of our country.

Pain a dominant feature characterizing IBS, and a significant factor in Rome's criteria for diagnosing IBS, was distinctly rare in the present study (41.7%, n=76). On applying Rome II criteria for diagnosis which has abdominal pain as the major criteria only 42 % of the patients in the present series satisfied the criteria. Also it was not a dominant factor for diarrhoea or constipation predominant IBS, suggesting that pain may not necessarily be an important factor for inclusion or exclusion

of a case as IBS.

Whether threshold of pain i.e. visceral hyperalgesia is set at higher levels for south Indians needs to be studied and results validated or is it that our patients are actually suffering from functional diarrhoea and not 'true' IBS ? Similar observations have been made by other gastroenterologists from other parts of India (Jayanthi et al, personal communication: Core Meet of ISG, Neemrana, 2005). Validity of Romes Criteria II needs to be validated for our patients in the near future.

SUMMARY

A.Bowel pattern in general population:

a. The average bowel frequency was 8.9 ± 4.8 per week with 95.8% of patients reporting a stool frequency between 3 and 21 times per week.

b. There was no difference with regard to age and sex in terms of bowel frequency and the form of stool except for those passing less than 3 per week.

c. Bowel movement of less than 3 per week was common amongst women

d. The prevalence of IBS in general population was 5.1%

B. Bowel pattern in IBS

a. IBS was more common among men in the ratio of 2.4:1.

b. The mean age of IBS patients was 39.3±12.2 years; majority of the patients were in the 3rd and 4th decades of life.

c. The duration of symptoms varied from 6 months to 5 years in 66%. Very few had an illness less than 6 months (8%).

d. Alcohol, smoking and disturbed sleep pattern was distinctly common amongst IBS as compared to the general population

e. Loose stool (69.7%) and increased frequency (68.6%) were the common symptoms followed by abdominal pain in 41.7%. Loose stool and increased frequency were common amongst men which was statistically significant. Hard stools (13.1%) and frequency of < 3 per week (9.8%) was an uncommon presentation, this was statistically significant among females.

f. Frequency and consistency of stools correlated in the majority. Higher the frequency more loose was the stool.

g. Subtypes:

   i. Diarrhoea predominant type (139): 76.4%

   ii. Constipation predominant (30): 16.5%

iii. Non specific /combination type (13): 7.1%

The Diarrhoea predominant type was common amongst men and the constipation predominant type was common amongst women both being statistically significant.

h. Diarrhoea predominant IBS:

i. Age of presentation was higher among women in comparison to men: (females: 41.6 $\pm$ 12.1 yrs vs. males: 37.6 $\pm$ 15.6 yrs)

ii. No significant differences among other lower GI symptoms, dyspepsia, genitourinary symptoms or in their demographic characteristics in either gender

i. Constipation – predominant IBS:

No significant difference in other lower GI symptoms, dyspepsia, genitourinary symptoms or in their demographic characteristics in either gender

j. Comparing the associated lower GI symptoms in the two major subtypes IBS-D and IBS-C

i. Incomplete evacuation, bloating and straining was significantly higher in IBS-C

ii. Urgency and passage of mucus was common in IBS-D, though not statistically significant.

CONCLUSION

Large population based studies are likely to provide a definite information on the normal bowel habit of southern Indian population of Tamil Nadu.

There may be a need to redefine the existing Rome II criteria for the southern Indian population of Tamil Nadu, since pain is not a dominant feature of IBS in this population.

The recommendations for diagnosis of IBS amongst the southern Indian population of Tamil Nadu requires the incorporation of the following variables.

a. Alteration of bowel pattern in terms of frequency / consistency
b. Duration of illness of more than or equal to 6 months
c. Pain should not be a major criteria for diagnosing IBS, rather it should be only a supportive feature
d. Criteria for subtypes:
    i. Diarrhoea predominant-IBS: Stool frequency > 3 per day, loose stool, with or without abdominal pain, presence of urgency and mucus in stool
    ii. Constipation predominant -IBS: stool frequency of less than 3 per week, hard stool, associated with abdominal bloat, straining and incomplete evacuation during the passage of stool

The proposed revised criteria needs validation in future prospective studies.

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Annexure 1

Proforma I: Bowel habits in healthy Southern Indian Individuals:

S.No.

Age:

Sex :

Occupation:

Educational qualification: Uneducated/ Primary/ Secondary/ College

Smoker: Yes/ No

Alcoholic: Yes/ No

What time did you sleep last night:

Did you have a Good/ disturbed sleep

As regards to your bowel movement

Do you pass motion every day? Yes/No

How many times do you pass on an average/ day/ week:

Consistency: Hard/ formed/ loose

Do you have abdominal discomfort / pain: Yes / No

If yes does the pain get relieved after defecation: Yes/ No

Pain associated with change in consistency: Yes/ No

Pain associated with change in frequency : Yes/ No

Do you want to pass but cannot pass : Yes / No

Do you pass mucus in stools?: Yes/No

Do you strain to pass stool : Yes / No

Do you have urgency : Yes / No

Do you regard yourself as : Normal/ Diarrhoea/ Constipation

If IBS: further evaluation as per Proforma II

Annexure 2

Proforma II: IBS PATIENT DATA

Name:

Age :

Sex: Male/ Female

Address:

Occupation:

Education: Uneducated/ Primary/ Secondary/ College

Smoking : Yes/No

Alcohol: Yes/No

Sleep Disturbance :Yes/No

SYMPTOMS

How long are you suffering from your symptoms?

How many times do you pass on an average:

<3 per week / 3 per day to 3 per week/ >3per day

What is the consistency of stools? Hard/ formed/ loose

Do you have abdominal discomfort / pain: Yes / No

- If yes does the pain get relieved after defecation : Yes/ No
- Onset of pain associated with change in consistency : Yes/ No
- Onset of pain associated with change in frequency : Yes/ No

Incomplete evacuation? Yes/ No

Mucus with stools? Yes/ No

Unusual straining? Yes/ No

Urgency? Yes/ No

Abdominal bloat? Yes/ No

Upper abdominal pain and burning (discomfort)? Yes/ No

Burning in the chest? Yes/ No

Chest pain? Yes/ No

Urinary difficulty? Yes/ No

Burning during passing urine? Yes/ No

Do you have any source of tension in family/

present workplace or elsewhere? (Stress) Yes/ No

Bleeding during passing stool? Yes/ No

Do you have diarrhoea after going to bed at night? Yes/ No

History of weight loss/ Reduced Appetite? Yes/ No

Investigations

Hb%: g/dl

TC : /mm^3

DC :

Blood sugar: mg/dl

(F / PP /R)

Stool microscopy :

Occult blood : +ve/ -ve

Blood sugar:

Blood urea/S. Creatinine

Thyroid function tests: T3, T4, TSH

Ultrasound -

Barium meal -

Barium enema-

UGI Endoscopy (specify)

Duodenal Biopsy -

Colonosocpy (specify) -

Any other (specify)